ENGINEERING

TELECOMUNICATIONS AND LOW POWER CHEMICAL SENSORS FOR TRANSPORTATION SAFETY

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The railroad industry is very safety conscious and has an exemplary safety track record in shipping commodities across North America. UTLX, a leading manufacturer of rail Tank-cars, are now focusing on improvements that can detect and monitor for NAR [non-accidental releases]. A non-accidental chemical release can be caused by natural processes, which over a long period of time cause old valves or gaskets to wear or by operator error. In an attempt to improve safety standards, we are working with UTLX to incorporate modern technology into the safety programs. Currently there are no products on the market that can detect a leak in chlorine gas at low levels during transport by railcar across the country.

The effort of this research is to design and build a working chlorine sensor coupled to telecommunications that will be field tested on Union Tank Car chlorine tankers. The methodology requires the integration of chlorine sensors, circuits to interpret the results, and circuits to disburse the collected data both to a device attached to the railroad car itself as well as by remote telemetry to a website. This will allow us to track a tank car's status as to leaks, the need for maintenance, and whereabouts anywhere in North America. Taking advantage of modern telecommunication and low power chemical sensor technology, the devices are designed to mount to the man-way of the railcar. The chemical sensor technology, cell phone technology, and software are part of a working system scheduled to be completed and put into field and laboratory testing by early to mid November.

The scope of this research has broad implications for improving transportation safety. Not only are chlorine sensors of this type non-existent, but so are sensors that detect the presence of other potentially dangerous gases. There is research being conducted to determine the market for such devices and the different varieties of sensors possible. The objective is to expand the project to design an instrument that is not limited in scope, but can be generic in its design so that a variety of sensors can be inserted without changing the hardware, thus creating a multi-use sensing device at the lowest cost possible. This product will benefit both the railroad industry and the civilian community around the world and may be extended to truck, air or ocean shipment safety problems.

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